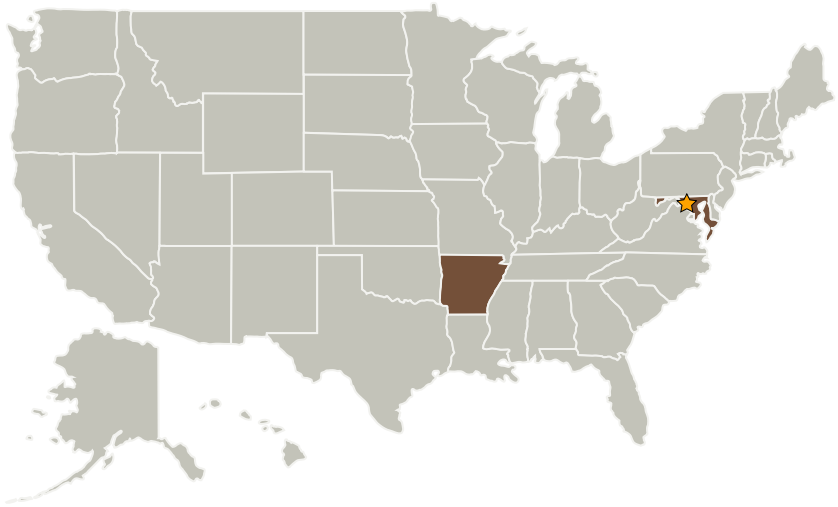
Development of Modular Spray-Cooled Assemblies for High Heat Fluxes, Phase I

Completed Technology Project (2004 - 2005)

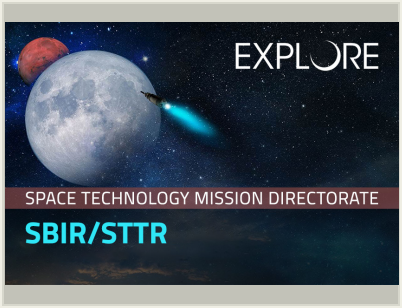
Project Introduction

This NASA SBIR project will develop modular spray-cooled assemblies that satisfy NASA power and mass budgets and can be scaled to cool multiple heat sources subjected to high heat fluxes and microgravity conditions. Much of the work on spray cooling has been experimental in nature and technological improvements have been the result of extensive experimental work. There is a need for a better theoretical understanding. Power Electronics Leveling Solutions L.L.C. (PELS) analytical team has formulated mathematically the conditions for extracting high heat fluxes from a heated surface in addition to the latent heat of vaporization that takes place in the formation of the bubble under phase change. PELS has now the opportunity of combining its analytical and experimental capabilities to develop modular assemblies based on spray cooling with the goal of achieving heat fluxes in excess of 100 W/cm2 while satisfying power and mass budgets.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Power Electronics Leveling Solutions LLC	Supporting Organization	Industry	Fayetteville, Arkansas



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations	
Arkansas	Maryland

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Jeremy Junghans

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.3 Heat Rejection and Storage